

	L #	Hits	Search Text	DBs	Time Stamp
1	L1	61324	rta rtp rto anneal annealing annealed anneals annealling annealled	USPAT	2001/03/1 4 15:18
2	L2	6357	1 near10 (oxide dielectric insulator insulating insulation)	USPAT	2001/03/1 4 13:59
3	L3	785	2 and (infrared infra-red ir)	USPAT	2001/03/1 4 15:23
4	L4	123	2 and ((mercury Hg xenon Xe) near4 lamp)	USPAT	2001/03/1 4 14:02
5	L5	865	3 4	USPAT; EPO; JPO	2001/03/1 4 14:04
6	L9	110	5 and ((interface surface) near3 state)	USPAT	2001/03/1 4 15:22
7	L10	24	9 and @rlad<19930825	USPAT	2001/03/1 4 15:22
8	L11	36	9 and @ad<19930825	USPAT	2001/03/1 4 15:22
9	L12	33	9 and @prad<19930825	USPAT	2001/03/1 4 15:22
10	L13	60	10 11 12	USPAT	2001/03/1 4 14:08
11	L14	4591	1 near25 (oxygen "O. ₂ " ozone "O. ₃ " oxidizing)	USPAT	2001/03/1 4 15:19
12	L15	203	1 near25 ("n. ₂ " adj O) or (nitrous adj oxide))	USPAT	2001/03/1 4 15:20
13	L16	6146	1 near25 (NO or (nitric adj oxide))	USPAT	2001/03/1 4 15:21
14	L17	9674	14 15 16	USPAT	2001/03/1 4 15:21
15	L18	638	17 and ((interface interfacial surface) near3 state)	USPAT	2001/03/1 4 15:23
16	L19	174	18 and @rlad<19930825	USPAT	2001/03/1 4 15:23
17	L20	264	18 and @ad<19930825	USPAT	2001/03/1 4 15:23
18	L21	228	18 and @prad<19930825	USPAT	2001/03/1 4 15:23
19	L22	395	19 20 21	USPAT	2001/03/1 4 15:23
20	L23	71	22 and (infrared infra-red ir)	USPAT	2001/03/1 4 15:54
21	L24	46	22 and (pinhole densify densified densifying)	USPAT	2001/03/1 4 15:55
22	L25	6	22 and (densifies)	USPAT	2001/03/1 4 15:55
23	L26	46	24 25	USPAT	2001/03/1 4 15:56
24	L27	35	26 and (\$3cvd)	USPAT	2001/03/1 4 15:56

Set	Items	Description
S1	24	(ANNEAL?(10N)(OXYGEN OR OXIDIZING OR NITROUS OR NITRIC)) A- ND (((INTERFACE OR SURFACE)(3N)(STATE?)) OR TRAP?) AND (PECVD OR CVD OR LPCVD) AND (SILICON(W)(OXIDE OR DIOXIDE))
S2	0	S1 AND (PD=<1994 OR PD<19930825)
S3	16	RD S1 (unique items)

?t s3/full/all

3/19/1 (Item 1 from file: 2)
 DIALOG(R)File 2:INSPEC
 (c) 2001 Institution of Electrical Engineers. All rts. reserv.

6731278 INSPEC Abstract Number: A2000-22-7340Q-009, B2000-11-2530F-029
 Title: Si-TiO₂ / interface evolution at prolonged annealing in low
 vacuum or N₂O ambient
 Author(s): Erkov, V.G.; Devyatova, S.F.; Molodstova, E.L.; Malsteva, T.V.
 ; Yanovskii, U.A.
 Author Affiliation: Inst. of Semicond. Phys., Novosibirsk, Russia
 Journal: Applied Surface Science Conference Title: Appl. Surf. Sci.
 (Netherlands) vol.166 p.51-6
 Publisher: Elsevier,
 Publication Date: 9 Oct. 2000 Country of Publication: Netherlands
 CODEN: ASUSEE ISSN: 0169-4332
 SICI: 0169-4332(20001009)166L:51:TIEP;1-R
 Material Identity Number: I974-2000-019
 U.S. Copyright Clearance Center Code: 0169-4332/2000/\$20.00
 Conference Title: Seventh International Conference on the Formation of
 Semiconductor Interfaces
 Conference Date: 21-25 June 1999 Conference Location: Goteborg, Sweden
 Document Number: S0169-4332(00)00415-3
 Language: English Document Type: Conference Paper (PA); Journal Paper
 (JP)
 Treatment: Experimental (X)
 Abstract: Titanium dioxide layers were obtained by the low-pressure
 chemical vapour deposition (LPCVD) method from a TiCl₄ / H₂ /
 and N₂O mixture at 630 degrees C and had rutile modification. The
 dielectric constant of the titanium dioxide is high, approximately 110, and
 the breakdown electric field strength more than 1 MV/cm. The fixed charge
 for the Si-TiO₂ structures is negative and has a value in the order
 of 5*10⁻⁸ C cm⁻² and the interface state density of these
 structures is 6*10¹⁰ eV⁻¹ cm⁻². After annealing in
 oxidizing ambient, the dielectric constant is found to fall off, and the
 interface density of states of the Si-TiO₂ structures is
 increased. It is proposed that this is connected with the Si-TiO₂ /
 interface evolution by the formation of a superthin silicon dioxide
 layer. (16 Refs)
 Subfile: A B
 Descriptors: annealing; CVD coatings; electric breakdown; electronic
 density of states; interface states; permittivity;
 semiconductor-insulator boundaries; silicon; titanium compounds
 Identifiers: Si-TiO₂ / interface evolution; prolonged annealing; low
 vacuum; N₂O ambient; low-pressure chemical vapour deposition; LPCVD
 ; rutile modification; dielectric constant; breakdown electric field
 strength; fixed charge; interface state density; oxidizing ambient;
 interface density of states; superthin silicon dioxide layer; 630
 degC; N₂O; Si-TiO₂
 Class Codes: A7340Q (Electrical properties of
 metal-insulator-semiconductor structures); A7720 (Dielectric permittivity)
 ; A5280 (Electric discharges); A7750 (Dielectric breakdown and
 space-charge effects); A7320A (Surface states, band structure, electron
 density of states); A6170A (Annealing processes); B2530F (Metal-insulator-semiconductor structures); B2810D (Dielectric breakdown and
 discharges); B2550A (Annealing processes in semiconductor technology)
 Chemical Indexing:
 N₂O bin - N₂ bin - N bin - O bin (Elements - 2)
 Si-TiO₂ int - TiO₂ int - O₂ int - Si int - Ti int - O int - TiO₂ bin - O₂

3/19/2 (Item 2 from file: 2)

DIALOG(R)File 2:INSPEC
(c) 2001 Institution of Electrical Engineers. All rts. reserv.

5858499 INSPEC Abstract Number: B9804-2560R-061
Title: Back-surface passivation of polycrystalline CdSe thin-film

transistors
Author(s): Landheer, D.; Masson, D.P.; Belkouch, S.; Das, S.R.; Quance, T.; LeBrun, L.; Hulse, J.E.

T.; LeBrun, L.; Huise, G.L.
Author Affiliation: Inst. for Microstruct. Sci., Nat. Res. Council of
Canada, Ottawa, Ont., Canada
Journal: J. of Vacuum Science & Technology A (Vacuum, Surfaces, and

Journal: Journal of Vacuum Science & Technology A (Vacuum, Surfaces, and Films) Conference Title: J. Vac. Sci. Technol. A, Vac. Surf. Films (USA)

Films) Conference 1914-1915
vol.16, no.2 p.834-7

Publisher: ATP for Amer

Publisher: AIP for American Vacuum Soc., Country of Publication: USA
Publication Date: March-April 1998

Publication Date: March-April 1998 Country of Publication: USA
ISSN: 0734-2101

CODEN: JVTAD6 ISSN: 0734-2101

SICI: 0734-2101(199803/04)16:2L;834:BSPP;1-0

Material Identity Number: D746-98002

Material Identity Number: 00000000000000000000000000000000 Copyright Clearance Center Code: 0734-2101/98/16(2)/834/4/\$10.00

U.S. Copyright Clearance Center
Conference Title: Eighth Canadian Semiconductor Technology Conference

Conference Title: Eighth Canadian Semiconductor Conference
Conference Date: 12-15 Aug. 1997 Conference Location: Ottawa, Ont.,

Canada

Document Number: S0734-2101(98)04202-X

Language: English Document Type: Conference Paper (PA); Journal Paper

(JP)

Treatment: Practical (P); Experimental (X)

Abstract: The electrical characteristics of simple inverted-gate *Cd* thin-film transistors (TFTs) were monitored after annealing and back-surface passivation treatments and the results were correlated with chemical analysis of the back interface. A dramatic increase in TFT current was observed after a short vacuum anneal at 320 degrees C. X-ray photoelectron spectroscopy (XPS) analysis showed that the vacuum anneal removed part of the oxide bonded to Se from the back (top) surface. This was confirmed by temperature-programmed desorption data for oxidized CdSe, which showed two distinct selenium oxide species desorbing above 300 degrees C. XPS analysis showed that evaporated SiO, or SiO₂ deposited by microwave plasma-enhanced chemical-vapor deposition, reacted strongly with an oxidized CdSe surface by removing the Se-bound oxygen present after an air anneal. Changes in the width of the Cd 3d_{5/2} peak suggested that the Cd bound oxygen was also transferred to the SiO during the deposition of the oxide. A reoxidation of the CdSe/SiO interface occurred after annealing in air at 350 degrees C. In contrast, silicon dioxide deposited by e-beam evaporation did not react as strongly with the native oxide. The interfacial oxide was reduced by annealing in forming gas. A reduced CdSe surface with no Se bonded to oxygen and a narrow Cd 3d_{5/2} XPS peak was associated with a high density of donors at the interface. (9 Refs)

Subfile: B

Subjct. 5
Descriptors: annealing; cadmium compounds; electron beam deposition; II-VI semiconductors; impurity states; interface states; interface structure; oxidation; passivation; plasma CVD; silicon compounds; thermally stimulated desorption; thin film transistors; X-ray photoelectron spectra

spectra
Identifiers: back-surface passivation; polycrystalline CdSe thin-film transistors; electrical characteristics; inverted-gate CdSe thin-film transistors; TFTs; annealing; back-surface passivation treatments; chemical analysis; TFT current; short vacuum annealing; X-ray photoelectron spectroscopy; XPS; oxide; temperature-programmed desorption; oxidized CdSe; selenium oxide; microwave plasma-enhanced chemical-vapor deposition; Se-bound oxygen; reoxidation; CdSe/SiO interface; e-beam evaporation; interfacial oxide; donors; 300 to 350 C; CdSe-SiO₂ / sub 2 /

Class Codes: B2560R (Insulated gate field effect transistors); B2550E (Surface treatment for semiconductor devices); B2550A (Annealing processes for semiconductor devices); B0520F (Vapour deposition)

Chemical Indexing:

CdSe-SiO₂ int - CdSe int - SiO₂ int - Cd int - O₂ int - Se int - Si int - O int - CdSe bin - SiO₂ bin - Cd bin - O₂ bin - Se bin - Si bin - O bin

(Elements - 2,2,4)

Numerical Indexing: temperature 5.73E+02 to 6.23E+02 K

Copyright 1998, IEE

3/19/3 (Item 3 from file: 2)

DIALOG(R) File 2:INSPEC

(c) 2001 Institution of Electrical Engineers. All rts. reserv.

5035531 INSPEC Abstract Number: A9519-8115H-025

Title: Defects generated by Fowler-Nordheim injection in silicon dioxide films produced by plasma-enhanced chemical-vapour deposition with nitrous oxide and silane

Author(s): Landheer, D.; Tao, Y.; Xu, D.-X.; Sproule, G.I.; Buchanan,

D.A.

Author Affiliation: Inst. for Microstructural Sci., Nat. Res. Council of Canada, Ottawa, Ont., Canada

Journal: Journal of Applied Physics vol.78, no.3 p.1818-23

Publication Date: 1 Aug. 1995 Country of Publication: USA

CODEN: JAPIAU ISSN: 0021-8979

U.S. Copyright Clearance Center Code: 0021-8979/95/78(3)/1818/6/\$6.00

Language: English Document Type: Journal Paper (JP)

Treatment: Practical (P); Experimental (X)

Abstract: High quality silicon dioxide films have been produced using a direct plasma-enhanced chemical vapour deposition process with silane, nitrous oxide and helium that leaves a nitrided layer at the Si-SiO₂/sub 2/ interface. X-ray photoelectron spectroscopy coupled with etch-back of the films has shown that the interface nitrogen is incorporated by nitridation of the silicon surface. Fowler-Nordheim injection measurements on thin films annealed after deposition for 1 minute at 950 degrees C show that the neutral-trap generation and interface state generation rates are comparable to that of thermal oxide if a proper deposition power is chosen. The data is consistent with an interpretation in which fast donor states, not P_{sub}b/ centres, account for almost all of the increase in the charge trapped at the interface. Too high deposition powers lead to excessive nitrogen and higher interface state generation rates. It is proposed that improved performance under hot-electron stress could be obtained by using an optimal deposition power to obtain an optimal nitrogen concentration followed by annealing in oxygen. (32 Refs)

Subfile: A

Descriptors: crystal defects; defect states; insulating thin films; interface states; plasma CVD coatings; silicon compounds; X-ray photoelectron spectra

Identifiers: Fowler-Nordheim injection; plasma-enhanced chemical-vapour deposition; Si-SiO₂/sub 2/ interface; X-ray photoelectron spectroscopy; etch-back; interface nitrogen; annealed; neutral-trap generation; interface state generation rates; fast donor states; hot-electron stress ; 1 min; 950 C; SiO₂/sub 2

Class Codes: A8115H (Chemical vapour deposition); A7360H (Electronic properties of insulating thin films); A6855 (Thin film growth, structure, and epitaxy); A7960E (Photoelectron spectra of semiconductors and insulators); A7865J (Optical properties of nonmetallic thin films); A7320H (Surface impurity and defect levels; energy levels of adsorbed species); A6860 (Physical properties of thin films, nonelectronic)

Chemical Indexing:

SiO₂ int - O₂ int - Si int - O int - SiO₂ bin - O₂ bin - Si bin - O bin

(Elements - 2)

Numerical Indexing: time 6.0E+01 s; temperature 1.22E+03 K

Copyright 1995, IEE

Ref. might have something

3/19/4 (Item 4 from file: 2)

DIALOG(R) File 2:INSPEC

(c) 2001 Institution of Electrical Engineers. All rts. reserv.

4661956 INSPEC Abstract Number: A9411-7340Q-012, B9406-2530F-024

Title: The effects of gamma irradiation on low-pressure chemical-vapor-deposited silicon dioxide metal-oxide-silicon structures

Author(s): Ang, S.S.; Shi, Y.J.; Brown, W.D.; West, L.

Author Affiliation: Dept. of Electr. Eng., Arkansas Univ., Fayetteville, AR, USA

Journal: Microelectronics and Reliability vol.34, no.5 p.909-19

Publication Date: May 1994 Country of Publication: UK

CODEN: MCRLAS ISSN: 0026-2714

U.S. Copyright Clearance Center Code: 0026-2714/94/\$6.00+.00

Language: English Document Type: Journal Paper (JP)

Treatment: Experimental (X)

Abstract: The effects of gamma irradiation on as-deposited, oxygen-annealed, and dual-dielectric gate (undoped polysilicon/oxide) low-pressure chemical-vapor-deposited (LPCVD) silicon dioxide ($\text{SiO}_{\text{sub}} 2$) metal-oxide-silicon (MOS) structures were investigated. As-deposited LPCVD $\text{SiO}_{\text{sub}} 2$ /MOS structures exhibit the largest shift in flatband voltage with gamma irradiation. This is most likely due to the large number of bulk oxide traps resulting from the nonstoichiometric nature of as-deposited LPCVD $\text{SiO}_{\text{sub}} 2$. Dual-dielectric (undoped polysilicon/annealed LPCVD $\text{SiO}_{\text{sub}} 2$) MOS structures exhibit the smallest shift in flatband voltage and increase in interface state density compared to as-deposited and oxygen-annealed LPCVD $\text{SiO}_{\text{sub}} 2$ /MOS structures. The interface state density of dual-dielectric MOS structures increases from $5 \times 10^{10} \text{ eV cm}^{-2}$ to $2-3 \times 10^{11} \text{ eV cm}^{-2}$ after irradiation to a gamma total dose level of 1 Mrads(Si). This result suggests that the recombination of atomic hydrogen atoms with silicon dangling bonds, either along grain boundaries or in crystallites of the undoped polysilicon layer in dual-dielectric (undoped polysilicon/annealed LPCVD $\text{SiO}_{\text{sub}} 2$) MOS structures, probably reduces the number of atomic hydrogen atoms reaching the $\text{Si/SiO}_{\text{sub}} 2$ interface to generate interface states. (23 Refs)

Subfile: A B

Descriptors: annealing; capacitance; CVD coatings; dangling bonds; gamma-ray effects; interface electron states; metal-insulator-semiconductor structures; silicon compounds

Identifiers: gamma irradiation; LPCVD $\text{SiO}_{\text{sub}} 2$ /MOS structures; oxygen-annealing; dual-dielectric MOS structures; flatband voltage shift; bulk oxide traps; nonstoichiometric nature; undoped polysilicon; interface state density; gamma total dose level; dangling bonds; atomic H atom recombination; grain boundaries; crystallites; C-V characteristics; 1 Mrad; Si- $\text{SiO}_{\text{sub}} 2$

Class Codes: A7340Q (Metal-insulator-semiconductor structures); A6180E (Gamma rays); A7320H (Impurity and defect levels; energy levels of adsorbed species); A6170A (Annealing processes); B2530F (Metal-insulator-semiconductor structures)

Chemical Indexing:

Si-SiO₂ int - SiO₂ int - O₂ int - Si int - O int - SiO₂ bin - O₂ bin - Si bin - O bin - Si el (Elements - 1,2,2)

Numerical Indexing: radiation absorbed dose 1.0E+04 Gy

3/19/5 (Item 5 from file: 2)

DIALOG(R) File 2:INSPEC

(c) 2001 Institution of Electrical Engineers. All rts. reserv.

4414697 INSPEC Abstract Number: A9313-7340Q-004

Title: Electrical characterization of low-pressure chemical-vapor-deposited silicon dioxide metal-oxide-silicon structures

Author(s): Ang, S.S.; Shi, Y.J.; Brown, W.D.

Author Affiliation: Dept. of Electr. Eng., Arkansas Univ., Fayetteville, AR, USA

Journal: Journal of Applied Physics vol.73, no.5 p.2397-401

Q4. J82

Publication Date: 1 March 1993 Country of Publication: USA
CODEN: JAPIAU ISSN: 0021-8979
U.S. Copyright Clearance Center Code: 0021-8979/93/052397-05\$06.00
Language: English Document Type: Journal Paper (JP)
Treatment: Experimental (X)

Abstract: The electrical characteristics of as-deposited and oxygen-annealed low-pressure chemical-vapor-deposited (LPCVD) silicon dioxide (SiO_{2}) metal-oxide-silicon (MOS) structures were investigated. As-deposited LPCVD SiO_{2} MOS structures exhibit a high oxide fixed charge density in the mid- 10^{11} cm $^{-2}$ and an interface state density in the low- 10^{11} cm $^{-2}$ eV $^{-1}$ due to the large number of oxygen and silicon dangling bonds. A low electron barrier height in these structures (1.2 eV) is presumed to be due to lowering of the barrier by excess silicon microclusters. Oxygen-annealed LPCVD SiO_{2} MOS structures exhibit oxide fixed charge and interface state densities in the mid- 10^{10} cm $^{-2}$ and mid- 10^{10} cm $^{-2}$ eV $^{-1}$, respectively. Both the as-deposited and annealed devices exhibit turnaround in flatband voltage shift with avalanche electron injection. However, the direction of shift is opposite for the two devices with the annealed device being very similar to that of thermally grown SiO_{2} MOS structures. Apparently, oxygen annealing restructures and oxidizes the partial SiO_x in the as-deposited LPCVD oxide into stoichiometric SiO_{2} . However, the residual nonstoichiometric SiO_{2} microclusters in the bulk result in an electron barrier height of only 2.3 eV. (24 Refs)

Subfile: A

Descriptors: annealing; CVD coatings; dangling bonds; interface electron states; metal-insulator-semiconductor structures; silicon; silicon compounds

Identifiers: electrical characteristics; low-pressure chemical-vapor-deposited; MOS structures; fixed charge density; interface state density; dangling bonds; annealed devices; flatband voltage shift; avalanche electron injection; stoichiometric; microclusters; SiO_{2} -Si

Class Codes: A7340Q (Metal-insulator-semiconductor structures); A7320D (Electron states in low-dimensional structures); A7320H (Impurity and defect levels; energy levels of adsorbed species)

Chemical Indexing:

SiO_2 -Si int - SiO_2 int - O2 int - Si int - O int - SiO_2 bin - O2 bin - Si bin - O bin - Si el (Elements - 2,1,2)

3/19/6 (Item 6 from file: 2)

DIALOG(R) File 2:INSPEC
(c) 2001 Institution of Electrical Engineers. All rts. reserv.

03653723 INSPEC Abstract Number: A90083115, B90043722

Title: The structure and electrical characteristics of oxidized semi-insulating polycrystalline silicon

Author(s): Hsieh, B.-C.; Greve, D.W.

Author Affiliation: Dept. of Electr. & Comput. Eng., Carnegie Mellon Univ., Pittsburgh, PA, USA

Journal: Journal of Applied Physics vol.67, no.5 p.2494-500

Publication Date: 1 March 1990 Country of Publication: USA

CODEN: JAPIAU ISSN: 0021-8979

U.S. Copyright Clearance Center Code: 0021-8979/90/052494-07\$03.00

Language: English Document Type: Journal Paper (JP)

Treatment: Experimental (X)

Abstract: The influence of an oxidizing ambient on the structure and electrical characteristics of thin films of semi-insulating polysilicon (SIPOS) has been studied. It is shown that SIPOS films 135 nm thick can be completely oxidized to amorphous silicon dioxide after 24 h at 600 degrees C in wet oxygen. The midgap interface state density after oxidation and postmetallization anneal is 4×10^{10} cm $^{-2}$ eV $^{-1}$. The authors also show that this material is suitable for use as a low-temperature deposited gate dielectric for polycrystalline thin-film transistors. (33 Refs)

Subfile: A B

Descriptors: annealing; CVD coatings; electronic conduction in insulating thin films; elemental semiconductors; insulating thin films; interface electron states; oxidation; semiconductor-insulator boundaries; silicon; silicon compounds
Identifiers: semiconductor; structure; electrical characteristics; thin films; SIPOS; midgap interface state density; oxidation; postmetallization anneal; low-temperature; gate dielectric; thin-film transistors; 600 degC; Si-SiO₂
Class Codes: A7340Q (Metal-insulator-semiconductor structures); A8115H (Chemical vapour deposition); A8160C (Semiconductors); A6855 (Thin film growth, structure, and epitaxy); A7360H (Insulating thin films); A7320D (Electron states in low-dimensional structures); B2530F (Metal-insulator-semiconductor structures); B2520C (Elemental semiconductors); B2550E (Surface treatment and oxide film formation)

Chemical Indexing:

Si-SiO₂ int - SiO₂ int - O₂ int - Si int - O int - SiO₂ bin - O₂ bin - Si bin - O bin - Si el (Elements - 1,2,2)

Numerical Indexing: temperature 8.73E+02 K

3/19/7 (Item 7 from file: 2)

DIALOG(R) File 2:INSPEC
(c) 2001 Institution of Electrical Engineers. All rts. reserv.

00981188 INSPEC Abstract Number: A76091178, B76046133
Title: Relationships of the chemical and electrical interfacial properties of germanium-SiO₂/systems

Author(s): Wang, K.L.; Gray, P.V.
Author Affiliation: Res. & Dev. Center, General Electric Co., Schenectady, NY, USA
Journal: Journal of the Electrochemical Society vol.123, no.9 p. 1392-8

Publication Date: Sept. 1976 Country of Publication: USA

CODEN: JESOAN ISSN: 0013-4651

Language: English Document Type: Journal Paper (JP)

Treatment: Experimental (X)

Abstract: Germanium-silicon dioxide structures were prepared by depositing SiO₂ on cleaned germanium wafers using chemical vapor deposition (CVD) from the silane-oxygen reaction at 450 degrees C. The structures were then annealed in various gas environments, Ar, O₂, and a 10%-H₂ and 90%-N₂ forming gas, at 600 degrees C for 2 hr. For samples annealed in forming gas, the interface state density measured by C-V techniques shows a high density near the band edges (10¹⁴/cm²-eV). For samples annealed in oxygen, it decreases to 10¹¹/cm²-eV. High surface recombination velocity was observed in the samples annealed in forming gas. The measured results of charge generation and injection indicated charge losses to the interface states but not to oxide traps. Profile analyses of the structures were carried out using secondary ion mass spectrometry (SIMS) and Auger electron spectroscopy (AES). (19 Refs)

Subfile: A B

Descriptors: electron traps; elemental semiconductors; germanium; semiconductor-insulator boundaries; silicon compounds; surface electron states

Identifiers: electrical interfacial properties; annealed; surface recombination velocity; charge generation; injection; charge losses; interface states; oxide traps; secondary ion mass spectrometry; Auger electron spectroscopy; Ge-SiO₂ structure; chemical vapour deposition; chemical interfacial properties; semiconductor insulator interface

Class Codes: A7320 (Electronic surface states); A7330 (Surface double layers, Schottky barriers, and work functions); A7340Q (Metal-insulator-semiconductor structures); B0510 (Crystal growth); B2530F (Metal-insulator-semiconductor structures); B2550 (Semiconductor device technology)

3/19/8 (Item 1 from file: 8)

DIALOG(R) File 8: Ei Compendex(R)
(c) 2001 Engineering Info. Inc. All rts. reserv.

05690194 E.I. No: EIP00115391308

Title: Si-TiO₂ interface evolution at prolonged annealing in low vacuum
or N₂/20 ambient

Author: Erkov, V.G.; Devyatova, S.F.; Molodstova, E.L.; Malsteva, T.V.;
Yanovskii, U.A.

Corporate Source: Siberian Branch, Novosibirsk, Russia

Source: Applied Surface Science v 166 n 1 Oct 2000. p 51-56

Publication Year: 2000

CODEN: ASUSEE ISSN: 0169-4332

Language: English

Document Type: JA; (Journal Article) Treatment: T; (Theoretical); X;
(Experimental)

Journal Announcement: 0012W2

Abstract: Titanium dioxide layers were obtained by the low-pressure chemical vapour deposition (LPCVD) method from a TiCl₄, H₂ and N₂/20 mixture at 630 degree C and had rutile modification. The dielectric constant of the titanium dioxide is high, approximately 110, and the breakdown electric field strength more than 1 MV/cm. The fixed charge for the Si-TiO₂ structures is negative and has a value in the order of 5 multiplied by 10¹² minus 8 C cm⁻² minus 2 and the interface state density of these structures is 6 multiplied by 10¹⁸ eV⁻¹ minus 1 cm⁻² minus 2. After annealing in oxidizing ambient, the dielectric constant is found to fall off, and the interface density of states of the Si-TiO₂ structures is increased. It is proposed that this is connected with the Si-TiO₂ interface evolution by the formation of a superthin silicon dioxide layer. (Author abstract) 16 Refs.

Descriptors: *Semiconducting films; Semiconducting silicon; Titanium dioxide; Chemical vapor deposition; Annealing; Interfaces (materials); Electric breakdown of solids; Thin films; Permittivity; Chemical modification

Identifiers: Low-pressure chemical vapour deposition (LPCVD) method

Classification Codes:

712.1.1 (Single Element Semiconducting Materials)

712.1 (Semiconducting Materials); 804.2 (Inorganic Components); 802.2 (Chemical Reactions); 813.1 (Coating Techniques); 537.1 (Heat Treatment Processes)

712 (Electronic & Thermionic Materials); 804 (Chemical Products); 802 (Chemical Apparatus & Plants); 813 (Coatings & Finishes); 537 (Heat Treatment)

71 (ELECTRONICS & COMMUNICATIONS); 80 (CHEMICAL ENGINEERING); 81 (CHEMICAL PROCESS INDUSTRIES); 53 (METALLURGICAL ENGINEERING)

3/19/9 (Item 2 from file: 8)

DIALOG(R) File 8: Ei Compendex(R)
(c) 2001 Engineering Info. Inc. All rts. reserv.

05518470 E.I. No: EIP00045112321

Title: Influence of gas desorption from SiOF film prepared by high-density-plasma chemical vapor deposition upon TiN/Ti film

Author: Tamura, Takahiro; Sakai, Junro; Satoh, Makoto

Corporate Source: Rohm Hamamatsu Co Ltd, Shizuoka, Jpn

Source: Japanese Journal of Applied Physics, Part 1: Regular Papers and Short Notes and Review Papers v 38 n 12A Dec 1999. p 6571-6576

Publication Year: 1999

CODEN: JAPNDE ISSN: 0021-4922

Language: English

Document Type: JA; (Journal Article) Treatment: X; (Experimental)

Journal Announcement: 0005W4

Abstract: The influence of gas desorption from fluorine-doped silicon oxide (SiOF) film prepared by high density-plasma chemical vapor deposition (CVD) upon TiN/Ti film is investigated. In this investigation, two types of SiOF films, containing 14% and 6% fluorine atoms, are compared with regard to gas desorption and diffusion of fluorine, hydrogen and

oxygen atoms into TiN/Ti film on SiOF film, as-deposited TiN/Ti/SiOF film and after 400 degree C annealing. In addition, W film was prepared on TiN/Ti/SiOF film in order to examine the practical effect of gas desorption upon adhesion between Ti film and SiOF film. Thermal desorption mass spectroscopy (TDS) and secondary-ion mass spectroscopy (SIMS) spectral studies clarified the following. (1) SiOF film containing 14% fluorine atoms has a high hydrogen-fluoride content due to moisture absorption after exposure to air, while that containing 6% fluorine atoms does not. (2) During deposition of TiN/Ti film at 200 degree C, many fluorine and hydrogen atoms diffuse from SiOF film containing 14% fluorine atoms and are trapped within the Ti film or the Ti/SiOF interface. (3) During 400 degree C annealing, more fluorine atoms diffuse from SiOF film containing 14% fluorine atoms and are also trapped within the Ti film. (4) Fluorine atoms trapped within the Ti film degrade the adhesion between Ti film and SiOF film. (Author abstract) 36 Refs.

Descriptors: Semiconducting silicon compounds; Desorption; Plasma enhanced chemical vapor deposition; Fluorine; Semiconductor doping; Hydrogen; Oxygen; Annealing; Titanium nitride; Secondary ion mass spectrometry

Identifiers: Gas desorption; Fluorine doped silicon oxide; Thermal desorption mass spectroscopy; High density plasma chemical vapor deposition

Classification Codes:

712.1.2 (Compound Semiconducting Materials)

712.1 (Semiconducting Materials); 802.3 (Chemical Operations); 932.3 (Plasma Physics); 537.1 (Heat Treatment Processes)

712 (Electronic & Thermionic Materials); 802 (Chemical Apparatus & Plants); 932 (High Energy, Nuclear & Plasma Physics); 804 (Chemical Products); 537 (Heat Treatment)

71 (ELECTRONICS & COMMUNICATIONS); 80 (CHEMICAL ENGINEERING); 93 (ENGINEERING PHYSICS); 53 (METALLURGICAL ENGINEERING)

3/19/10 (Item 3 from file: 8)

DIALOG(R) File 8: Ei Compendex(R)

(c) 2001 Engineering Info. Inc. All rts. reserv.

03081591 E.I. Monthly No: EIM9106-029549

Title: High performance metal/SiO//2/InSb capacitor fabricated by photo-enhanced chemical vapor deposition.

Author: Sun, Tai-Ping; Lee, Si-Chen; Liu, Kou-Chen; Pang, Yen-Ming; Yang, Sheng-Jenn

Corporate Source: Natl Taiwan Univ, Taipei, Taiwan

Conference Title: Physical Concepts of Materials for Novel Optoelectronic Device Applications I: Materials Growth and Characterization

Conference Location: Aachen, Ger Conference Date: 19901028

Sponsor: SPIE

E.I. Conference No.: 14617

Source: Proceedings of SPIE - The International Society for Optical Engineering v 1361 pt 2. Publ by Int Soc for Optical Engineering, Bellingham, WA, USA. p 1033-1037

Publication Year: 1991

CODEN: PSISDG ISSN: 0277-786X

Language: English

Document Type: PA; (Conference Paper) Treatment: X; (Experimental)

Journal Announcement: 9106

Abstract: The high performance AuCr/SiO//2InSb metal-oxide-semiconductor capacitor was fabricated successfully using photo-enhanced chemical vapor deposition. Authors have studied the chemical and electrical properties of photo-SiO//2 oxide on InSb by means of AES analysis and C-V characterization. The low frequency C-V results indicate that high-quality silicon dioxide can be deposited at an optimal substrate temperature of 150 degree C by photo-CVD. When the MOS device received a high temperature (190 degree C) thermal annealing, the interface charges and the hysteresis behavior of C-V curves are observed to change significantly. Large amount of unsaturated silicon atoms are observed from AES to appear at the SiO//2/native oxide interface whatever the deposition temperature is, whereas oxygen atoms pile up at the native oxide/InSb interface after

annealing at 190 deg C. The former results in the creation of positive fixed charges, the latter helps to reduce the density of fast interface states. (Edited author abstract) 20 Refs.

Descriptors: *CAPACITORS--*Fabrication; SEMICONDUCTOR DEVICES, MOS; SEMICONDUCTING INDIUM COMPOUNDS--Chemical Vapor Deposition; GOLD CHROMIUM ALLOYS; SPECTROSCOPY, AUGER ELECTRON

Identifiers: INDIUM ANTIMONIDE

Classification Codes:

714 (Electronic Components); 712 (Electronic & Thermionic Materials); 802 (Chemical Apparatus & Plants); 547 (Precious & Rare Earth Metals & Alloys); 543 (Chromium, Manganese, Molybdenum, Tantalum, Tungsten, Vanadium & Alloys); 531 (Metallurgy & Metallography)
71 (ELECTRONICS & COMMUNICATIONS); 80 (CHEMICAL ENGINEERING); 54 (METAL GROUPS); 53 (METALLURGICAL ENGINEERING)

3/19/11 (Item 1 from file: 34)
DIALOG(R) File 34:SciSearch(R) Cited Ref Sci
(c) 2001 Inst for Sci Info. All rts. reserv.

05196008 Genuine Article#: VG681 Number of References: 14
Title: PARAMAGNETIC DEFECT SPIN CENTERS IN LOW-PRESSURE

CHEMICAL-VAPOR-DEPOSITED SILICON- DIOXIDE FILMS

Author(s): KAMIGAKI Y; YOKOGAWA K; HASHIMOTO T; UEMURA T
Corporate Source: HITACHI LTD,CENT RES LAB/KOKUBUNJI/TOKYO 185/JAPAN/;
HITACHI LTD,SEMICOND & INTEGRATED CIRCUIT DIV/KODAIRA/TOKYO 187/JAPAN/;
HITACHI ULSI ENGN CORP/KODAIRA/TOKYO 187/JAPAN/

Journal: JOURNAL OF APPLIED PHYSICS, 1996, V80, N6 (SEP 15), P3430-3434

ISSN: 0021-8979

Language: ENGLISH Document Type: ARTICLE

Geographic Location: JAPAN

Subfile: SciSearch; CC PHYS--Current Contents, Physical, Chemical & Earth Sciences

Journal Subject Category: PHYSICS, APPLIED

Abstract: We have found E'-like and amorphous-siliconlike (a-Si-like, . Si=Si-3) spin centers, as well as the well-known E' center (. Si=O-3) in low-pressure chemical-vapor-deposited silicon -dioxide (LPCVD -SiO₂) films, by using the electron-spin-resonance method. The behavior of these paramagnetic defect centers is studied and their origins are considered. An E'-like center is terminated stably by either oxygen (O-2) or hydrogen (H-2) gas annealing . This E'-like center appears to be an intermediately generated defect but its bonding structure has not yet been identified. The a-Si-like center is terminated stably by high-temperature H-2 gas annealing. The a-Si-like center is thought to exist in the Si clusters in LPCVD -SiO₂ films. We have also confirmed that the E' center is terminated stably by O-2 gas annealing. As a result, we conclude that both O-2 and H-2 gas annealing are necessary to reduce the quantity of paramagnetic defect centers in LPCVD -SiO₂ films. (C) 1996 American Institute of Physics.

Identifiers--KeyWords Plus: RESONANCE; A-SIO2; SI

Research Fronts: 94-3280 002 (INTERFACE STATE GENERATION MODEL FOR SILICON METAL-OXIDE-SEMICONDUCTOR FIELD-EFFECT TRANSISTORS; MOS DEVICES; HOT-CARRIER DEGRADATION)

Cited References:

CONLEY JF, 1994, V76, P8186, J APPL PHYS
DEVINE RAB, 1991, V69, P2480, J APPL PHYS
GRISCOM DL, 1992, V149, P137, J NON-CRYST SOLIDS
HIKITA H, 1993, V164, P219, J NONCRYSTALLINE SOL
KAMIGAKI Y, P12, UNPUB 1995 IEEE IRPS
LENAHAN PM, 1984, V55, P3495, J APPL PHYS
MINAMI S, 1993, V40, P2011, IEEE T ELECTRON DEV
MORI S, 1992, V39, P283, IEEE T ELECTRON DEV
POINDEXTER EH, 1981, V52, P879, J APPL PHYS
TSAI TE, 1987, V91, P170, J NON-CRYST SOLIDS
WARREN WL, 1992, V139, P872, J ELECTROCHEM SOC
YAMANAKA T, 1995, V42, P1305, IEEE T ELECTRON DEV
YOKOMICHI H, 1987, V63, P629, SOLID STATE COMMUN

3/19/12 (Item 2 from file: 34)
DIALOG(R) File 34:SciSearch(R) Cited Ref Sci
(c) 2001 Inst for Sci Info. All rts. reserv.

00881283 Genuine Article#: FD596 Number of References: 12
Title: METAL-OXIDE SEMICONDUCTOR CHARACTERISTICS OF RAPID THERMAL PROCESSED
CHEMICAL VAPOR-DEPOSITED SiO₂ GATE DIELECTRICS
Author(s): TING W; LI PC; LO GQ; LEE J; KWONG DL
Corporate Source: UNIV TEXAS,DEPT ELECT & COMP ENGN,MICROELECTR RES
CTR/AUSTIN//TX/78712
Journal: SOLID-STATE ELECTRONICS, 1991, V34, N4, P385-388
Language: ENGLISH Document Type: ARTICLE
Geographic Location: USA
Subfile: SciSearch; CC PHYS--Current Contents, Physical, Chemical & Earth
Sciences; CC ENGI--Current Contents, Engineering, Technology & Applied
Sciences
Journal Subject Category: ENGINEERING, ELECTRICAL & ELECTRONIC
Abstract: Current conduction, interfacial integrity, and charge trapping
characteristics of 200 angstrom rapid thermal nitrided/reoxidized
(RTN/RTO) chemical vapor deposited (CVD) SiO₂ are studied. Results
show that RTN reduces the leakage current of CVD oxides, contrary to
the effects of RTN on thermal oxides. The as-deposited CVD oxide
after rapid thermal annealing (RTA) in O₂ has the lowest electron
trapping level as compared with the other devices, while devices with
RTN/RTO gate dielectrics have superior endurance against constant
current stressing. The increased electron trapping induced by RTN
can be minimized by pre- and post-nitridation annealing in oxygen.
Identifiers--KeyWords Plus: REOXIDIZED NITRIDED OXIDES; ELECTRICAL
CHARACTERISTICS; SiO₂-FILMS; BREAKDOWN; SiO₂; VLSI
Research Fronts: 89-1736 002 (RADIATION-INDUCED INTERFACE STATE
GENERATION IN MOS DEVICES; RAPID THERMAL NITRIDED GATE OXIDES;
TOTAL-DOSE HARDNESS ASSURANCE ISSUES FOR SOI MOSFETS)
89-3918 001 (TIME-DEPENDENT DIELECTRIC-BREAKDOWN OF
CHEMICAL-VAPOR-DEPOSITED SiO₂ GATE DIELECTRICS; MOS DEVICES; SILICON
DIOXIDE FILMS)

Cited References:
ANG S, 1987, V134, P1254, J ELECTROCHEM SOC
HORI T, 1988, V35, P904, IEEE T ELECTRON DEV
HORI T, 1989, V36, P340, IEEE T ELECTRON DEV
HWANG H, 1989, V55, P755, APPL PHYS LETT
ITO T, 1982, V29, P498, IEEE T ELECTRON DEV
LAI SK, 1982, V129, P2042, J ELECTROCHEM SOC
LEE J, 1986, V7, P506, IEEE ELECTR DEVICE L
MOSLEHI MM, 1985, V32, P106, IEEE T ELECTRON DEV
SHIH DK, 1988, V52, P1698, APPL PHYS LETT
TING W, 1989, V25, P689, ELECTRON LETT
WU AT, 1989, V10, P443, IEEE ELECTR DEVICE L
YAMABE K, 1985, V32, P423, IEEE T ELECTRON DEV

3/19/13 (Item 3 from file: 34)
DIALOG(R) File 34:SciSearch(R) Cited Ref Sci
(c) 2001 Inst for Sci Info. All rts. reserv.

00702580 Genuine Article#: EP011 Number of References: 10
Title: RADIATION-INDUCED CHARGE TRAPPING IN IMPLANTED BURIED OXIDES
Author(s): BRADY FT; LI SS; KRULL WA
Corporate Source: UNIV FLORIDA,DEPT ELECT ENGN/GAINESVILLE//FL/32611;
HARRIS CORP,SEMICOND/MELBOURNE//FL/32901
Journal: JOURNAL OF APPLIED PHYSICS, 1990, V68, N12, P6143-6149
Language: ENGLISH Document Type: ARTICLE
Geographic Location: USA
Subfile: SciSearch; CC PHYS--Current Contents, Physical, Chemical & Earth
Sciences

Journal Subject Category: PHYSICS, APPLIED

Abstract: We investigate the response of buried oxide layers formed by oxygen implantation to total dose x-ray irradiation. The characterization is based on C-V measurements of the buried oxide capacitor and on back-channel transistor measurements. Reduced charge trapping is found for material implanted with a lower oxygen dose, annealed at higher temperatures, and annealed for longer times. Also, total-dose irradiation was found to generate few interface traps. A particularly interesting result is that an increase in the concentration of shallow donors with x-ray dose was observed for certain samples. This increase in the donor concentration was observed only in the top Si film.

Identifiers--KeyWords Plus: OXYGEN IMPLANTATION; SILICON; INSULATOR
Research Fronts: 89-0199 001 (PLASMA-ENHANCED CHEMICAL VAPOR-DEPOSITION
OF SILICON DIOXIDE; AMORPHOUS SiN FILMS; LPCVD NITRIDE PROCESS;
DOPED SiO₂)

Cited References:

BRADY FT, 1988, V52, P886, APPL PHYS LETT
BRADY FT, 1989, V36, P2187, IEEE T NUCL SCI
CAZCARRA V, 1980, V51, P4206, J APPL PHYS
CRISTOLOVEANU S, 1987, V62, P2793, J APPL PHYS
DRESSENDORFER PV, 1989, P333, IONIZING RAD EFFECTS
MAO BY, 1986, V33, P1702, IEEE T NUCL SCI
MAO BY, 1987, V34, P1692, IEEE T NUCL SCI
NAGAI K, 1985, V28, P289, SOLID STATE ELECTRON
NICOLLIAN EH, 1982, MOS PHYSICS TECHNOLOGY
WINOKUR PS, 1989, P207, IONIZING RAD EFFECTS

3/19/14 (Item 1 from file: 144)

DIALOG(R) File 144:Pascal

(c) 2001 INIST/CNRS. All rts. reserv.

14800382 PASCAL No.: 00-0480965
Si-TiO₂ SUB 2 interface evolution at prolonged annealing in low vacuum or
N SUB 2 O ambient

Proceedings of the Seventh International Conference on the Formation of
Semiconductor Interfaces, Goeteborg, Sweden, June 21-25, 1999

ERKOV V G; DEVYATOVA S F; MOLODSTOVA E L; MALSTEVA T V; YANOVSKII U A
KANSKI Janusz, ed; NILSSON Per-Olof, ed
Institute of Semiconductor Physics, Siberian Branch, 630090 Novosibirsk,
Russia

Chalmers University of Technology and Goeteborg University, Goeteborg,
Sweden

ICFSI International Conference on the Formation of Semiconductor
Interfaces, 7 (Goeteborg SWE) 1999-06-21

Journal: Applied surface science, 2000, 166 51-56
ISSN: 0169-4332 Availability: INIST-16002; 354000092094700090

No. of Refs.: 16 ref.

Document Type: P (Serial); C (Conference Proceedings) ; A (Analytic)

Country of Publication: Netherlands

Language: English

Titanium dioxide layers were obtained by the low-pressure chemical vapour deposition (LPCVD) method from a TiCl₄ SUB 4, H₂ SUB 2 and N₂ SUB 2 O mixture at 630 Degree C and had rutile modification. The dielectric constant of the titanium dioxide is high, approximately 110, and the breakdown electric field strength more than 1 MV/cm. The fixed charge for the Si-TiO₂ SUB 2 structures is negative and has a value in the order of 5 X 10¹² cm⁻² and the interface state density of 6 X 10¹² cm⁻², these structures is increased. After annealing in oxidizing ambient, the dielectric constant is found to fall off, and the interface density of states of the Si-TiO₂ SUB 2 structures is increased. It is proposed that this is connected with the Si-TiO₂ SUB 2 interface evolution by the formation of a superthin silicon dioxide layer.

English Descriptors: Experimental study; Solid-solid interfaces; Annealing;

Silicon; Titanium oxide; CVD ; Interface states ; CV racteristic;
Semiconductor materials
Broad Descriptors: Transition element compounds; Inorganic compounds; Metal
transition compose; Compose mineral

French Descriptors: Etude experimentale; Interface solide solide; Recuit;
Silicium; Titane oxyde; Depot chimique phase vapeur; Etat interface;
Caracteristique capacite tension; Materiau semiconducteur; Si; O Ti; TiO₂
; 7340Q

Classification Codes: 001B70C40Q

Copyright (c) 2000 INIST-CNRS. All rights reserved.

3/19/15 (Item 2 from file: 144)

DIALOG(R)File 144:Pascal
(c) 2001 INIST/CNRS. All rts. reserv.

14300701 PASCAL No.: 99-0507498
Photoluminescence from hydrogenated amorphous silicon oxide thin
films
Amorphous and crystalline insulating thin films II
ZHU M; HAN Y; GODET C; WEHRSPOHN R B
WILSON I H, ed; DEVINE R A B, ed
Department of Physics, Graduate School, University of Science and
Technology of China, P.O. Box 3908, Beijing 100039, China; National
Laboratory for Super lattices and Microstructures, Beijing 100083, China;
Laboratoire de Physique des Interfaces et des Couches Mince, Ecole
Polytechnique, 91128 Palaiseau, France; Laboratoire de Physique de la
Matiere Condensee, CNRS-Ecole Polytechnique, 91128 Palaiseau, France
Department of Electronic Engineering, The Chinese University of Hong Kong
, Hong Kong, China; France Telecom, CNET, Meylan, France
International Conference on Amorphous and Crystalline Insulating Thin
Films, 2 (Hong Kong CHN) 1998-10-12
Journal: Journal of non-crystalline solids, 1999, 254 74-79
ISSN: 0022-3093 CODEN: JNCSBJ Availability: INIST-14572;

354000089229820090

No. of Refs.: 21 ref.

Document Type: P (Serial); C (Conference Proceedings) ; A (Analytic)

Country of Publication: Netherlands

Language: English

The photoluminescence (PL) properties of amorphous silicon oxide with
different oxygen content prepared by dual-plasma chemical vapor deposition
have been studied. The PL bands in the energy range of 1.7 to 3.2 eV were
observed. The visible light emission from a-SiO_x :H is sensitive to
the oxygen content. The 3.2 and 2.58 eV PL bands are independent of x. The
2.58 eV PL band is attributed to interfacial defects states. The 3.2 eV PL
band is attributed to the oxygen excess defects.

English Descriptors: Experimental study; Thin films; Photoluminescence;
Amorphous hydrogenated material; Film growth; CVD ; Silicon oxides;
oxygen content; Defect states ; Interface states ; Annealing
Broad Descriptors: Inorganic compounds; Compose mineral

French Descriptors: Etude experimentale; Couche mince; Photoluminescence;
Materiau amorphe hydrogene; Croissance film; Depot chimique phase vapeur;
Silicium oxyde; Teneur oxygene; Etat defaut; Etat interface; Recuit;
a-SiO_x:H; O Si; 7855A; 7866J; 7155J

Classification Codes: 001B70H55A; 001B70H66J; 001B70A55J

Copyright (c) 1999 INIST-CNRS. All rights reserved.

3/19/16 (Item 1 from file: 347)

DIALOG(R)File 347:JAPIO

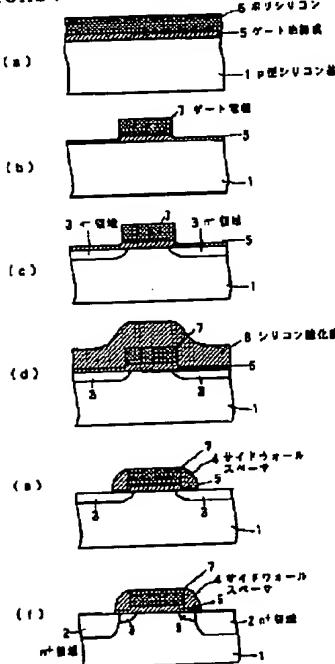
05393493 **Image available**
MANUFACTURE OF MOS FIELD-EFFECT TRANSISTOR

PUB. NO.: 09-008293 [JP 9008293 A]
PUBLISHED: January 10, 1997 (19970110)
INVENTOR(s): YAMAMOTO KAZUHIRO
APPLICANT(s): SUMITOMO METAL IND LTD [000211] (A Japanese Company or
Corporation), JP (Japan)
APPL. NO.: 07-154571 [JP 95154571]
FILED: June 21, 1995 (19950621)
INTL CLASS: [6] H01L-029/78; H01L-021/336; H01L-021/324
JAPIO CLASS: 42.2 (ELECTRONICS -- Solid State Components)
JAPIO KEYWORD: R097 (ELECTRONIC MATERIALS -- Metal Oxide Semiconductors,
MOS); R100 (ELECTRONIC MATERIALS -- Ion Implantation)

ABSTRACT

PURPOSE: To suppress the implantation of electrons by a hot carrier effect and to extend the deteriorating life of mutual conductance by forming an oxide film for forming a sidewall spacer by a CVD method, and then annealing the oxide film of the spacer in an oxygen atmosphere.

CONSTITUTION: A gate insulating film 5 and a polysilicon 6 are deposited on a p-type silicon substrate 1, and with the oxide film as a mask the polysilicon 6 is etched to form a gate electrode 7. Then, with the polysilicon 6 as a mask phosphorus is ion implanted to form an n^(sup -) type electrode 7 of a low concentration impurity region. Thereafter, a silicon oxide film 8 is deposited by an HTO-CVD, and to reduce the electron trap in the silicon oxide film, it is annealed in an oxygen atmosphere. Then, the film 8 is dry etched to form a sidewall spacer 4 at the side of the electrode 7, arsenic is implanted to form n^(sup +) type regions of a high concentration impurity region on source and drain regions.



Status: Signing Off

logoff

14mar01 17:07:13 User264704 Session D8.3
\$1.76 0.286 DialUnits File2
\$15.75 7 Type(s) in Format 9
\$15.75 7 Types
\$17.51 Estimated cost File2
\$0.80 0.125 DialUnits File8
\$6.60 3 Type(s) in Format 9
\$6.60 3 Types
\$7.40 Estimated cost File8
\$2.57 0.179 DialUnits File34
\$12.60 3 Type(s) in Format 9
\$12.60 3 Types
\$15.17 Estimated cost File34
\$3.54 1.011 DialUnits File144
\$3.10 2 Type(s) in Format 9
\$3.10 2 Types
\$6.64 Estimated cost File144
\$14.65 1.338 DialUnits File347
\$1.75 1 Type(s) in Format 19
\$1.75 1 Types
\$16.40 Estimated cost File347
OneSearch, 5 files, 2.940 DialUnits FileOS
\$0.50 TYMNET
\$63.62 Estimated cost this search
\$74.89 Estimated total session cost 11.635 DialUnits

SYSTEM:OS - DIALOG OneSearch

File 2:INSPEC 1969-2003/Mar W2
(c) 2003 Institution of Electrical Engineers
***File 2: Alert feature enhanced for multiple files, duplicates removal, customized scheduling. See HELP ALERT.**
File 8:EI Compendex(R) 1970-2003/Mar W2
(c) 2003 Elsevier Eng. Info. Inc.
***File 8: Alert feature enhanced for multiple files, duplicates removal, customized scheduling. See HELP ALERT.**
File 65:Inside Conferences 1993-2003/Mar W3
(c) 2003 BLDSC all rts. reserv.
File 94:JICST-EPlus 1985-2003/Mar W3
(c)2003 Japan Science and Tech Corp(JST)
***File 94: UDs have been adjusted to reflect current months data. There is no data missing.**
File 144:Pascal 1973-2003/Mar W2
(c) 2003 INIST/CNRS

Set Items Description

--- -----

?s (PY<1994 or pd<930827) and (TEOS or tetraethoxysilane or tetra(w)ethoxysilane or tetraethoxy(w)silane or alkoxy silane)(15n)(gate(w2)(oxide or dielectric or insulator or insulating or isolating or isolator))

>>>One or more prefixes are unsupported

>>> or undefined in one or more files.

>>>File 144 processing for PD= : PD=930827

>>> started at PD=18019 stopped at PD=19831107

Processing

20544411 PY<1994

5108838 PD<930827

5113 TEOS

2761 TETRAETHOXYSILANE

16564 TETRA

85 ETHOXYSILANE

21 TETRA(W)ETHOXYSILANE

867 TETRAETHOXY

38765 SILANE

129 TETRAETHOXY(W)SILANE

449 ALKOXY SILANE

165651 GATE

649005 OXIDE

340320 DIELECTRIC

104076 INSULATOR

118141 INSULATING

10000 ISOLATING

8627 ISOLATOR

57 ...

S1 10 (PY<1994 OR PD<930827) AND (TEOS OR TETRAETHOXYSILANE OR TETRA(W)ETHOXYSILANE OR TETRAETHOXY(W)SILANE OR ALKOXY SILANE)(15N)(GATE(W2)(OXIDE OR DIELECTRIC OR INSULATOR OR INSULATING OR ISOLATING OR ISOLATOR))

?rd

...completed examining records
S2 6 RD (unique items)

?t s2/full/all

2/9/1 (Item 1 from file: 2)

DIALOG(R) File 2:INSPEC
(c) 2003 Institution of Electrical Engineers. All rts. reserv.

4596086 INSPEC Abstract Number: B9403-2560R-052
Title: High quality MOSFETs with N_{sub} 2/0 annealed thin TEOS gate

oxide

Author(s): Sun, S.C.; Chang, H.Y.; Chao, T.S.; Lu, C.Y.; Chang, S.W.;

Lee, K.Y.; Lee, L.S.

Author Affiliation: Nat. Nano Device Lab., Chiao Tung Univ., Hsinchu, Taiwan

Conference Title: 1993 International Symposium on VLSI Technology, Systems, and Applications. Proceedings of Technical Papers (Cat. No.93TH0524-9) p.109-11
Publisher: IEEE, New York, NY, USA
Publication Date: 1993 Country of Publication: USA xi+386 pp.
ISBN: 0 7803 0978 2
Conference Sponsor: IEEE; Nat. Sci. Council ROC; Ind. Technol. Res. Inst.
; MOEA, ROC; Chinese Inst. Electr. Eng.; et al
Conference Date: 12-14 May 1993 Conference Location: Taipei, Taiwan
Language: English Document Type: Conference Paper (PA)
Treatment: Practical (P); Experimental (X)
Abstract: The authors present the electrical characteristics of MOSFETs utilizing thin (125 AA) TEOS deposited gate oxides. Results show that devices of TEOS oxide with N_{sub} 2/O anneal have smaller initial drain current degradation under CHC stress condition. The transconduction degradation is slightly worse as compared to thermal gate oxide devices. (6 Refs)
Subfile: B
Descriptors: annealing; CMOS integrated circuits; insulated gate field effect transistors; nitridation; VLSI
Identifiers: CMOS; submicron device fabrication; LOCOS isolation; VLSI; tetraethoxysilane; hot carrier stress; high quality gate oxide; thin TEOS gate oxide; electrical characteristics; MOSFET; drain current degradation; transconduction degradation; N_{sub} 2/O anneal
Class Codes: B2560R (Insulated gate field effect transistors); B2550E (Surface treatment); B2570D (CMOS integrated circuits)
Chemical Indexing:
N2O bin - N2 bin - N bin - O bin (Elements - 2)

2/9/2 (Item 2 from file: 2)

DIALOG(R) File 2:INSPEC
(c) 2003 Institution of Electrical Engineers. All rts. reserv.

04359109 INSPEC Abstract Number: B9304-2560R-038
Title: Enhanced hot-carrier degradation due to water in TEOS/O_{sub} 3/-oxide and water blocking effect of ECR-SiO_{sub} 2/
3/-oxide and water blocking effect of ECR-SiO_{sub} 2/
Author(s): Shimoyama, N.; Machida, K.; Murase, K.; Tsuchiya, T.
Author Affiliation: NTT LSI Lab., Kanagawa, Japan
Conference Title: 1992 Symposium on VLSI Technology. Digest of Technical
Papers (Cat. No.92CH3172-4) p.94-5
Publisher: IEEE, New York, NY, USA
Publication Date: 1992 Country of Publication: USA x+120 pp.
ISBN: 0 7803 0698 8
U.S. Copyright Clearance Center Code: 92CH3172-4/92/0000-0094\$03.00
Conference Sponsor: IEEE; Japan Soc. Appl. Phys
Conference Date: 2-4 June 1992 Conference Location: Seattle, WA, USA
Language: English Document Type: Conference Paper (PA)
Treatment: Experimental (X)
Abstract: The effect of water and/or silanols in TEOS/O_{sub} 3/-oxide on hot-carrier degradation is discussed. Hot-carrier degradation in MOSFETs is a serious problem as the thickness of the TEOS/O_{sub} 3/-oxide interlayer dielectric increases. This results mainly from enhanced hot-electron trapping and also from interface-trap generation, which are related to water and/or silanols in TEOS/O_{sub} 3/-oxide diffusing into the gate oxide. It is pointed out that by applying an ECR (electron cyclotron resonance) SiO_{sub} 2/ layer under the TEOS/O_{sub} 3/-oxide layer, tolerance against hot-carrier damage is improved to the level of MOSFETs without the TEOS/O_{sub} 3/-oxide layer. (5 Refs)

Subfile: B
Descriptors: dielectric thin films; hot carriers; insulated gate field effect transistors; interface electron states; oxidation; semiconductor device testing; water
Identifiers: ECR layer; hot-carrier degradation; water blocking effect; silanols; MOSFETs; interlayer dielectric; enhanced hot-electron trapping; interface-trap generation; TEOS/O_{sub} 3/-oxide layer; Si-SiO_{sub} 2/ interface-trap generation; TEOS/O_{sub} 3/-oxide layer; Si-SiO_{sub} 2/
Class Codes: B2560R (Insulated gate field effect transistors); B2550E (

TEOS -PECVD SiO₂/ as the gate oxide . Source-drain regions are implanted with Si⁺ to create n⁺ layers. The effective electron channel mobility and transconductance are 1400 cm²/V.s and 6.4 ms/mm respectively. The characteristics of the MISFETs and long-term drain current drift of the MISFETs are discussed. (9 Refs)

Subfile: B

Descriptors: carrier mobility; III-V semiconductors; indium compounds; insulated gate field effect transistors; plasma CVD coatings

Identifiers: metal-insulator-semiconductor field effect transistor; n-channel enhancement mode InP MISFETs; gate oxide; n⁺ layers; effective electron channel mobility; transconductance; long-term drain current drift; InP-SiO₂; InP:Fe; InP:Fe, Si⁺ current drift; (Insulated gate field effect transistors)

Class Codes: B2560R

Chemical Indexing:

InP-SiO₂ int - SiO₂ int - InP int - In int - O₂ int - Si int - O int - P int - SiO₂ bin - InP bin - In bin - O₂ bin - Si bin - O bin - P bin

(Elements - 2,2,4)

InP:Fe sur - InP sur - Fe sur - In sur - P sur - InP:Fe ss - Fe ss - In ss - P ss - InP bin - In bin - P bin - Fe el - Fe dop (Elements - 2,1,3)

InP:Fe, Si int - InP int - Fe int - In int - Si int - P int - InP:Fe, Si ss - Fe ss - In ss - Si ss - P ss - InP bin - In bin - P bin - Fe el - Si el - Fe dop - Si dop (Elements - 2,1,1,4)

2/9/5 (Item 1 from file: 8)

DIALOG(R) File 8:EI Compendex(R)
(c) 2003 Elsevier Eng. Info. Inc. All rts. reserv.

03737078 E.I. No: EIP93101095206

Title: Enhanced hot-carrier degradation due to water-related components in TEOS/O//3 oxide and water blocking with ECR-SiO//2 film

Author: Shimoyama, Nobuhiro; Machida, Katsuyuki; Takahashi, Jun-ichi; Murase, Katsumi; Minegishi, Kazushige; Tsuchiya, Toshiaki

Corporate Source: NTT LSI Lab, Kanagawa, Jpn

Source: IEEE Transactions on Electron Devices v 40 n 9 Sep 1993. p 1682-1687

Publication Year: 1993

CODEN: IETDAI ISSN: 0018-9383

Language: English

Document Type: JA; (Journal Article) Treatment: X; (Experimental); T; (Theoretical)

Journal Announcement: 9312W4

Abstract: A TEOS/O//3-oxide layer used as an interlevel dielectric enhances hot-carrier degradation of MOSFET's due to the water-related components (water and/or silanols) contained in the layer. This results mainly from enhanced hot-electron trapping in the gate oxide and also from interface-trap generation. By applying an ECR-SiO//2 layer under the TEOS /O//3-oxide layer, tolerance against hot-carrier damage is improved to the level of MOSFET's without the TEOS/O//3 oxide. From ESR measurement results, it is found that the spin density of the ECR-SiO//2 film under the TEOS/O//3 oxide was two orders lower than that of the ECR-SiO//2 film only. It is speculated that the dangling bonds in the ECR-SiO//2 film effectively trap water diffusing from the water-containing overlayer. (Author abstract)

18 Refs.

Descriptors: *MOSFET devices; Hot carriers; Semiconducting silicon compounds; Oxides; Ozone

Identifiers: Enhanced hot carrier degradation; Water-related components; Interval dielectric; Hot electron trapping; ESR measurements; Tetra-ethoxysilane; Spin density; Dangling bonds

Classification Codes:

712.1.2 (Compound Semiconducting Materials)

714.2 (Semiconductor Devices & Integrated Circuits); 712.1

(Semiconducting Materials)

714 (Electronic Components); 712 (Electronic & Thermionic Materials);

804 (Chemical Products)

71 (ELECTRONICS & COMMUNICATIONS); 80 (CHEMICAL ENGINEERING)

2/9/6 (Item 1 from file: 65)
DIALOG(R) File 65:Inside Conferences
(c) 2003 BLDSC all rts. reserv. All rts. reserv.

00294599 INSIDE CONFERENCE ITEM ID: CN002752918
X High Quality MOSFET's with N~2O Annealed Thin TEOS Gate Oxide
Sun, S. C.; Chang, H. Y.; Chao, T. S.; Lu, C. Y.
CONFERENCE: VLSI technology, systems, and applications-International
symposium
INTERNATIONAL SYMPOSIUM ON VLSI TECHNOLOGY SYSTEMS AND APPLICATIONS,
1993; ISSUE 6 P: 109-111
IEEE, 1993
ISSN: NONE-0293 ISBN: 0780309782; 0780309790
LANGUAGE: English DOCUMENT TYPE: Conference Papers
CONFERENCE SPONSOR: National Science Council
Industrial Technology Research Institute
Institute of Electrical and Electronics Engineers
CONFERENCE LOCATION: Taipei
CONFERENCE DATE: May 1993 (199305) (199305)

BRITISH LIBRARY ITEM LOCATION: 4550.370600

NOTE:

IEEE Cat no 93TH0524-9
DESCRIPTORS: IEEE; VLSI technology; VLSI systems; VLSI applications

X
SAM
PSA

2/9/4 (Item 4 from file: 2)

DIALOG(R) File 2: INSPEC

(c) 2003 Institution of Electrical Engineers. All rts. reserv.

03453749 INSPEC Abstract Number: B89061672

Title: Study of n-channel enhancement mode InP MISFETs

Author(s): Jiang Ruolian; Zheng Youdou; Wang Renkang

Author Affiliation: Dept. of Phys. Nanjing Univ., China

Journal: Chinese Journal of Semiconductors vol.9, no.5 p.451-8

Publication Date: Sept. 1988 Country of Publication: China

CODEN: PTTPDZ ISSN: 0253-4177

Language: Chinese Document Type: Journal Paper (JP)

Treatment: Experimental (X)

Abstract: n-channel enhancement mode InP MISFETs based on the InP/SiO₂ interface are fabricated on Fe-doped S.I. InP (100) orientated with

TEOS -PECVD SiO₂ as the gate oxide. Source-drain regions are implanted with Si⁺ to create n⁺ layers. The effective electron channel mobility and transconductance are 1400 cm²/V.S and 6.4 ms/mm respectively. The characteristics of the MISFETs and long-term drain current drift of the MISFETs are discussed. (9 Refs)

Subfile: B

Descriptors: carrier mobility; III-V semiconductors; indium compounds; insulated gate field effect transistors; plasma CVD coatings

Identifiers: metal-insulator-semiconductor field effect transistor; n-channel enhancement mode InP MISFETs; gate oxide; n⁺ layers; effective electron channel mobility; transconductance; long-term drain current drift; InP-SiO₂; InP:Fe; InP:Fe, Si⁺

Class Codes: B2560R (Insulated gate field effect transistors)

Chemical Indexing:

InP-SiO₂ int - SiO₂ int - InP int - In int - O₂ int - Si int - O int - P int - SiO₂ bin - InP bin - In bin - O₂ bin - Si bin - O bin - P bin
(Elements - 2,2,4)

InP:Fe sur - InP sur - Fe sur - In sur - P sur - InP:Fe ss - Fe ss - In ss - P ss - InP bin - In bin - P bin - Fe el - Fe dop (Elements - 2,1,3)

InP:Fe, Si int - InP int - Fe int - In int - Si int - P int - InP:Fe, Si ss - Fe ss - In ss - Si ss - P ss - InP bin - In bin - P bin - Fe el - Si el - Fe dop - Si dop (Elements - 2,1,1,4)

BEST AVAILABLE COPY